

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Patent Appln. No. 09/256,346

REMARKS

Reconsideration and allowance of all claims are respectfully requested. Upon entry of this Amendment, claims 1-19 are pending in the application. In response to the Office Action (Paper No. 14), Applicant respectfully submits that the pending claims define patentable subject matter. By this Amendment, Applicant has amended claim 11 to improve clarity.

Claims 1, 8, 10, 11 and 16-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okada et al. (USP 4,800,382) in view of Applicant's admitted prior art. Claims 2 and 8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okada et al. in view of Applicant's admitted prior art and Kurematsu (USP 5,796,380). Claims 3-5 and 8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okada et al. in view of Applicant's admitted prior art, Bonnett et al. (USP 6,075,506) and Kurematsu. Claims 6 and 8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okada et al. in view of Applicant's admitted prior art, Kurematsu and Kamiya et al. (USP 4,694,348). Claims 7, 9 and 12-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okada et al. in view of Applicant's admitted prior art and Kamiya et al. Applicant respectfully submits that the claimed invention would not have been rendered obvious in view of the combined references.

Independent claim 1 recites a method for driving a liquid crystal display apparatus comprising the steps of: scanning successively a plurality of scan lines in a first field of a frame for display; simultaneously resetting the scan lines in the first field after the scan lines are successively scanned in the first field; scanning successively the scan lines in a second field of the frame for display in an order reverse to that in the first field; and simultaneously resetting the

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scan lines in the second field after the scan lines are successively scanned in the second field.

The method of claim 1 is illustrated in Figure 10 of the present application.

The Examiner maintains that Okada et al. (Okada) discloses all of the features of independent claim 1 except that “the scan lines are successively scanned in a second field in an order reverse to that in the first field”, which the Examiner asserts is disclosed by Applicant’s admitted prior art (Figure 7). However, as discussed in the specification, Figure 7 shows that positive writing is performed over four fields during a positive data voltage period and then negative writing is performed over four fields of negative data voltage period. That is, the scan lines are successively scanned in the same order (from top to bottom) in each of the fields.

Accordingly, Applicant respectfully submits that it is quite clear that Applicant’s admitted prior art does not teach or suggest scanning successively the scan lines in a second field of a frame for display in an order reverse to that in the first field, as recited in claim 1. Thus, independent claim 1, as well as dependent claims 2-9, should be allowable because the combined references, do not teach or suggest all of the features of the claims.

Independent claim 10 recites a method for driving a liquid crystal display element in a frame composed of a first field and a second field comprising the steps of (a) writing data a plurality of times in the first field by use of a predetermined signal voltage; and (b) writing data a plurality of times in the second field by use of a signal voltage whose polarity is opposite to that of the predetermined signal voltage. The method of claim 10 is illustrated in Figures 24 and 25 of the present application.

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The Examiner maintains that Okada et al. (Okada) discloses all of the features of independent claim 1 except “writing data a plurality of times to each of the scan lines”, which the Examiner asserts is disclosed by Applicant’s admitted prior art (Figures 6 and 7). However, as discussed in the specification, Figure 7 shows that positive writing is performed over four fields during a positive data voltage period and then negative writing is performed over four fields of a negative data voltage period. That is, the positive data voltage period and the negative data voltage period each include four fields, and in each field data is successively written only one time to each of the scan lines starting with the top scan line. Thus, while data is written four times in each scan line in the positive and negative data voltage periods, data is only written once in each scan line in each of the four fields of the positive and negative data voltage periods.

Accordingly, Applicant respectfully submits that it is quite clear that Applicant’s admitted prior art does not teach or suggest writing data a plurality of times in a (single) scan line in one (the first) field by use of a predetermined signal voltage and writing data a plurality of times in one scan line in the second field by use of a signal voltage whose polarity is opposite to that of the predetermined signal voltage, as recited in claim 10.

Independent claim 11 recites, in part, a method for driving a liquid crystal display element comprising writing data a plurality of times in a frame by use of a signal voltage whose polarity becomes alternately positive and negative a plurality of times during the frame at a predetermined frequency. The method of claim 11 is illustrated in Figures 26 and 27 of the present application. Although the Examiner does not appear to specifically address the subject matter of independent claim 11 in support of the rejection, Applicant respectfully submits that it

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is quite clear that neither Okada nor Applicant's admitted prior art teaches or suggests the subject matter of claim 11. Rather, Okada discloses writing once in black (i.e., a positive pulse) then writing once in white (i.e., a negative pulse) during one frame. Further, Applicant's admitted prior art discloses positive writing is performed over four fields during a positive data voltage period and then negative writing is performed over four fields of a negative data voltage period rather than writing data a plurality of times in a frame by use of a signal voltage whose polarity becomes alternately positive and negative a plurality of times during the frame at a predetermined frequency.

Accordingly, Applicant respectfully submits that independent claims 10 and 11, as well as dependent claims 12-15, should be allowable because the applied references do not teach or suggest all of the features of the claims.

Although the Examiner does not appear to specifically address the subject matter of independent claims 16-19 in support of the rejection, Applicant respectfully submits that it quite clear that neither Okada nor Applicant's admitted prior art teaches or suggests the subject matter of claims 16-19 (which is illustrated in Figures 12, 14, 16 and 17, respectively). In particular, none of the combined references disclose the claimed method of scanning successively odd-numbered scan lines or even-number scan lines in the claimed orders.

Further, Applicant respectfully submits that Bonnett, Kurematsu and Kamiya do not teach or suggest the above-described features of independent claims 1, 10, 11 and 16-19 which are clearly lacking from the combination of Okada and Applicant's admitted prior art.

Accordingly, Applicant respectfully submits that independent claims 1, 10, 11 and 16-19, as well

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as dependent claims 2-9 and 12-15, should be allowable because the combined references do not teach or suggest all of the features of the claims.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

11. (Twice Amended) A method for driving a liquid crystal display element forming a scan line, the method comprising writing data a plurality of times in a frame by use of a signal voltage having a polarity which becomes alternately positive and negative a plurality of times during the frame at a predetermined frequency, wherein the data is written [a plurality of times when] each time the polarity of the signal voltage is positive and [a plurality of times when] each time the polarity of the signal voltage is negative.